



## Pasadena Public Library

### Laser Cutting and Etching Policy

#### **What is laser cutting and etching?**

A laser cutter uses subtractive manufacturing to create a product. You put a piece of material in the machine (like leather, wood, or acrylic) and it carves out your product using laser light. Depending on the material used and the quality of the original artwork, lasers are capable of cutting and etching very fine details. The lasers are capable of etching a variety of bitmap images (BMP, PNG, JPEG, etc.) in “raster mode” where the laser moves back and forth over the image area to “paint in” the pixels. The laser cutter uses vector files (SVG, AI, PDF, etc.) for cutting and etching intricate line-art images in “vector mode” where the vectors define a specific path for the beam to follow.

#### **What materials can I use?**

Patrons are expected to provide their own materials to be cut or etched. Below is a list of materials that can be used for cutting/engraving.

#### **Cutting/Engraving**

- Wood
- Fabric
- Leather
- Paper
- Plexiglas (acrylic)
- Mylar
- Rubber
- Corian
- Foods

#### **Engraving Only**

- Glass
- Coated metal
- Marble
- Anodized aluminum
- Titanium
- Some phones, laptops, and tablets (Library isn't responsible for any damage to personal devices.)
- Ceramic tile
- Stone

A laser cutter performs well with many materials 1/4 in (0.6 cm) and less on a single pass. It can accommodate material as thick as 1/2 in (1.2 cm), but may require multiple passes or flipping the material over. For engraving, you can remove the tray and insert objects as thick as 2 in (5 cm). It can then engrave the surface up to 0.5 in (1.2 cm), depending on the material.

### **What software is used to create artwork and designs?**

Most any program that will work with bitmap (BMP, JPG, PNG, etc.) images can be used to create or edit artwork for "raster" engraving. This includes simple tools like MS Paint or Microsoft Word up through professional-grade software such as [GIMP](#) (free) or Adobe Photoshop. A wide variety of images can be downloaded from the internet. For cutting shapes, the laser cutter requires a 'vector' file. Vector shapes can be created and modified using [Inkscape](#) (free), or with a variety of CAD programs, including the free, browser-based [Tinkercad](#) and [Cuttle](#). Adobe Illustrator and CorelDRAW are popular commercial programs used to create vector art.

### **How can I use a laser cutter at PPL?**

Patrons who wish to use the laser cutter machine at PPL are expected to attend a free orientation class and earn a "laser cutter orientation/machine" badge on PPL's Beanstack Maker Challenge. The orientation class covers the basic operation of laser cutters, the tools and techniques to create the artwork files, and PPL's Laser Cutter Policy. After attending the orientation class, patrons will receive their laser cutter badge on Beanstack within two business days. Upon receiving the badge, patrons may request an appointment for the laser cutter to work on their project. Please allow two business days for your request to be confirmed.

### **I've taken the orientation class – now what?**

1. Sign into your Beanstack account or [sign up for a free account now](#). (If you have registered for PPL's Summer Reading Program in the past, you may already have an account). If you have a Harris County Beanstack account, patrons **must** create a separate account with PPL to track your Maker Lab trainings.
2. Click on the Maker Challenge. Once you are in, you will click on the "Badges" tab under the Maker Challenge image.
3. Click on the appropriate badge that you have earned depending on which machine orientation you have done. For example, if you have completed the laser cutter orientation, then click on that badge.
4. Fill out the reservation form and submit. You will receive an initial email that your request was received. Within two business days, you will receive an email confirming your request.
5. If you have any questions, please contact PPL for assistance.
6. Enjoy the benefits of being a badged Maker person!



### **Glowforge Plus**

- 40-watt CO2 laser
- Cutting & engraving area: 19.5" by 11"
- Max material height: 2" (50 mm)